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NITROGEN

PHOSPHATE

POTASH

THE FERTILIZER SUPPLY

1972-73



APRIL 1973

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Stabilization and Conservation Service
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SUMMARY

Net domestic supplies of fertilizer materials in 1972-73 are expected to total 19.0 million tons of plant nutrients - nitrogen (N), phosphate (P_2O_5), and potash (K_2O). This is the same as last year's supply.

Estimated supplies of N will total 8,993,000 tons, up 3 percent; P_2O_5 , 5,303,000 tons, down 2 percent; and K_2O , 4,699,000 tons, down 3 percent.

Production rate for anhydrous ammonia during the first 6 months of the fertilizer year was near that of last year. Solid ammonium nitrate production was up about 2 percent and ammonium sulfate production down about 2 percent. Production rates for urea, nitrogen solutions, and N-P materials ranged from 10 to 17 percent over last year.

Production rates for nitrogenous materials are expected to continue at rates above those of last year provided marketing channels can make room for them. Production of anhydrous ammonia is expected to rise to levels above last year to support the increased production of nitrogenous materials and the merchant anhydrous ammonia market.

Wet-process phosphoric acid production during the first half of the year was about 2 percent ahead of last year. Ammonium phosphate production was up 11 percent while concentrated superphosphate was down 4 percent.

This relationship could change during the second half of the fertilizer year because of changes in domestic and world market needs. Producers have some choice on whether to use limited quantities of phosphoric acid in ammonium phosphate or concentrated superphosphate. The normal superphosphate supply is expected to be about the same as last year.

About two-thirds of the net domestic supply of potassium chloride is expected to be imported, primarily from Canada. Domestic supplies are expected to be up about 2 percent in support of an expected increase in exports. The potassium sulfates are expected to be about the same as last year.

The spring season is more clouded than usual. In addition to the ever present risk of unfavorable weather, the shortage of railroad cars for moving fertilizers to consuming areas and the possible shortage of fuel for operating farmers' tractors could have an adverse influence on the quantities of fertilizer used by farmers. This can be minimized through favorable weather and the use of transportation and fuel resources as efficiently as possible.

1/ The fertilizer year is from July 1 through June 30.

Anhydrous ammonia facilities were operated at about 90 percent of total capacity during the first 6 months of the fertilizer year. Wet-process phosphoric acid facilities were operated at about 95 percent of capacity. Anhydrous ammonia capacity is scheduled for an expansion of 855,000 tons by January 1975. Phosphoric acid capacity is to be expanded 1,250,000 tons of P_2O_5 by January 1975.

Exports of N, P_2O_5 , and K_2O are expected to be 22 to 36 percent more than last year. Phosphate rock exports were up 6 percent over last year which means export of about 14.4 million tons if the trend continues.

U.S. exports of plant nutrients going to countries with AID agricultural programs were up 37 percent over last year. About 57 percent of all plant nutrients exported (excluding phosphate rock) went to these countries in 1971-72 compared with 45 percent a year earlier. These countries received 54 percent of the N, 65 percent of the P_2O_5 , and 48 percent of the K_2O . However, AID did not finance all these shipments. Brazil received 44 percent of the plant nutrients going to AID countries, but none of them were financed by AID.

NITROGEN (N)

Net supplies of N for domestic fertilizer use in 1972-73 are expected to total 8,993,000 tons, about 3 percent more than was available last year (table 1). Supplies from domestic sources will be up about 4 percent, but the expected export balance will reduce the quantity available for domestic use to about 3 percent over last year.

Supply from domestic production - Supplies of N from domestic production are expected to total 9,281,000 tons (table 1). Anhydrous ammonia shipped as such for fertilizer use will be up about 2 percent over last year. Trends in production of nitrogen solutions point to an increase of about 4 percent. Liquid nitrogen will be about 62 percent of the total domestic supply of N.

Solid ammonium nitrate supplies will be up 4 percent but a continued decline in ammonium sulfate of 13 percent is expected. Solid urea for fertilizer use will be up about 6 percent. Other solid nitrogen bearing materials will be up about 16 percent.

Imports - Nitrogen imports will total about 971,000 tons of N, 15 percent more than last year. Urea and nitrogen solutions will account for the increase. Imports of all other nitrogenous materials are expected to be smaller than those last year.

Table 1.--Nitrogen: Estimated supply of N for fertilizer purposes,
United States, fertilizer years, 1970-71, 1971-72, and 1972-73

Item	1970-71 <u>1/</u>	1971-72 <u>1/</u>	1972-73
	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>
Supply from domestic production:			
Liquids:			
Ammonia (including aqua)	4,132	3,838	3,922
All other	1,658	1,788	1,851
Total liquids	5,790	5,626	5,773
Solids:			
Ammonium nitrate <u>2/</u> <u>3/</u>	1,176	1,246	1,298
Ammonium sulfate <u>3/</u>	598	497	432
Urea	562	585	620
All other solids <u>4/</u>	798	1,000	1,158
Total solids	3,134	3,328	3,508
Total solids and liquids	8,924	8,954	9,281
Imports:			
Ammonia (including aqua)	412	323	294
Nitrogen solutions	58	36	63
Ammonium nitrate	123	131	119
Ammonium sulfate	46	55	54
Urea <u>3/</u>	118	131	292
Sodium nitrate	30	26	14
All other	142	141	135
Total	929	843	971
Exports:			
Ammonia (including aqua)	491	346	469
Ammonium nitrate	20	11	5
Ammonium sulfate	126	117	92
Urea	172	214	244
All other	268	344	449
Total	1,077	1,032	1,259
Net domestic supply	8,776	8,765	8,993

1/ Revised.

2/ Includes ammonium nitrate and ammonium nitrate-limestone mixtures.

3/ Adjusted for estimated quantity going into non-fertilizer uses.

4/ To avoid duplication, the figure for "all other solids" has been adjusted by the estimated amount of imported ammonia used in primary materials.

Exports - Nitrogen exports will total about 1,259,000 tons, 22 percent more than last year. This will reverse a 3-year decline in N exports. Ammonium nitrate and ammonium sulfate will be less than last year, but all other materials will increase.

Nitrogen capacities - Anhydrous ammonia capacity is estimated to have been 16.9 million tons NH_3 on January 1, 1973. Three plants were closed during 1972. Two plant expansions are scheduled for completion in 1973. Two jumbo plants have been announced at new locations.

Current capacity for producing urea for all uses is estimated to be 4.2 million tons of material, about 57 percent solid and 43 percent liquid. Ammonium nitrate capacity for production of fertilizer is estimated to be 6.3 million tons of material, also about 57 percent solid and 43 percent liquid. In addition, about 1.4 million tons of capacity is available for industrial use.

PHOSPHATE (P_2O_5)

Supplies of P_2O_5 will total 5,303,000 tons, about 2 percent less than in 1971-72 (table 2). Imports will be up 14 percent, but exports are expected to be up 36 percent.

Normal superphosphate - Total supplies of normal and enriched superphosphate from domestic production will be 678,000 tons of P_2O_5 , the same as last year. Imports will be negligible. Exports are expected to total about 7,000 tons of P_2O_5 , more than double those of the previous year.

Concentrated superphosphate - Supplies of concentrated superphosphate from domestic production are expected to total 1,605,000 tons of P_2O_5 , 4 percent less than last year. Imports will be more than double those of last year. Exports are expected to be up 42 percent, reflecting the strong demand and favorable prices on the world market.

Ammonium phosphate - Domestic supplies of ammonium phosphate are expected to total 2,664,000 tons of P_2O_5 , 10 percent more than in 1971-72. Imports will be up about 2 percent and exports up 33 percent.

World market for P_2O_5 - Strong demand and attractive prices for P_2O_5 on the world market have continued the pressure on domestic producers to take advantage of the more attractive prices. Even though some increase has been allowed in domestic prices under the economic stabilization program, world prices have also increased. Devaluation of the dollar made world market prices even more attractive. Domestic producers have to decide how much of their production can be exported without hardship to domestic customers and, in turn, shortchanging U.S. farmers.

Table 2.--Phosphate: Estimated supply of P_2O_5 for fertilizer purposes,
United States, fertilizer years, 1970-71, 1971-72, and 1972-73

	1970-71 <u>1/</u>	1971-72 <u>1/</u>	1972-73
	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>
Supply from domestic production:			
Normal and enriched superphosphate	626	678	678
Concentrated superphosphate	1,462	1,667	1,605
Ammonium phosphate <u>2/</u>	2,277	2,430	2,664
All other <u>3/</u>	1,371	1,399	1,482
Total	5,736	6,174	6,429
Imports:			
Concentrated superphosphate	14	23	50
Ammonium phosphate	203	210	214
All other	66	93	109
Total	283	326	373
Exports:			
Normal superphosphate	4	3	7
Concentrated superphosphate	288	333	473
Ammonium phosphate	507	689	916
All other	99	77	103
Total	898	1,102	1,499
Net domestic supply	5,121	5,398	5,303

1/ Revised.

2/ Liquid and solid ammonium phosphates excluding those combined with potash salts in the process of manufacture.

3/ Includes nitric phosphates, sodium phosphate, wet base goods, natural organics, phosphate rock, colloidal phosphate, basic slag, estimates of wet-process and furnace phosphoric acid for liquid and solid mixed fertilizers and direct application, and ammonium phosphates combined with potash salts in the process of manufacture.

Export markets for U.S. materials at favorable prices are not expected to continue when foreign plants under construction and proposed plants start producing. Several of these foreign plants are export oriented and will be competing for some of the same markets now supplied largely by U.S. producers.

Phosphoric acid - Domestic supplies of merchant phosphoric acid for fertilizer use are expected to be about the same as last year. Secondary manufacturers purchase acid to produce solid mixtures, solid N-P base materials, liquid N-P base materials, liquid mixed fertilizers, and for direct application.

Imports are expected to be up 32 percent, while exports are expected to be down 46 percent.

Direct application of ammonium phosphate - Direct application of selected ammonium phosphate grades totaled 2,869,440 tons of material in 1970-71, latest year for which data are available (table 3). This is an 8 percent increase in gross tonnage, 7 percent in N and 10 percent in P_2O_5 , over 1969-70.

The total quantity of the selected grades increased 37 percent during the 5-year period 1966-67 through 1970-71. The P_2O_5 content increased 54 percent and the nitrogen content increased 30 percent during the period.

Use of 18-46-0 accounted for 60 percent of the selected ammonium phosphate grades, and 67 percent of P_2O_5 in the selected grades.

Use of 10-34-0 in 1970-71 increased 28 percent over the previous year. This material is an ammonium polyphosphate made from wet-process based superphosphoric acid and anhydrous ammonia. The 11-37-0 is made from electric furnace based superphosphoric acid and anhydrous ammonia. Dependence on furnace acid has tended to limit product availability. Development of a process for producing 11-37-0 from wet-process acid or a wet-process and furnace acid blend may increase its availability.

The term ammonium phosphate, as used in this report, includes a group of N-P materials - monammonium and diammonium phosphates, mixtures of the two, or combinations with ammonium nitrate or ammonium sulfate plus ammonium polyphosphates.

Table 3 does not include all grades of ammonium phosphate. It does include some tonnage of N-P grades which are produced by mixing N and P_2O_5 source materials other than anhydrous ammonia and phosphoric acid or by other chemical processes. The 16-20-0 is an example of a material which is not necessarily an ammonium phosphate.

Phosphate capacities - Normal superphosphate capacity in operating plants is estimated to be about 1.1 million tons of P_2O_5 . Production during the first 6 months of the current fertilizer year is at about

Table 3.--Ammonium phosphates: Consumption of selected grades for direct application, United States, fertilizer years, 1966-67 through 1970-71

Grade	1966-67	1967-68	1968-69	1969-70	1970-71
11-55-0	8,461	20,912	33,497	42,671	45,792
13-52-0	31,327	51,695	60,898	55,327	68,214
10-34-0	91,594	138,035	189,341	234,093	299,745
11-37-0	42,102	50,218	44,925	51,405	47,186
11-48-0	199,238	205,151	155,620	130,598	139,138
13-39-0	7,853	15,342	30,343	25,222	22,728
16-20-0	500,108	492,368	516,514	428,171	384,705
16-48-0	70,868	72,108	79,580	60,174	51,364
18-46-0	906,372	1,246,953	1,491,388	1,514,911	1,716,365
21-53-0	30,602	33,013	22,211	34,959	42,862
23-23-0	39,074	39,774	25,310	17,955	
27-14-0	36,423	28,154	21,265	16,004	12,075
28-14-0	13,503	35,796	20,704	19,580	22,274
29-14-0	52,869	41,215	18,571		
30-10-0	64,609	58,308	37,500	31,016	16,992
Total	2,095,008	2,529,042	2,747,667	2,662,086	2,869,440
N content $\frac{2}{2}$	359,978	430,827	459,026	439,994	469,643
P ₂ O ₅ content $\frac{2}{2}$	763,390	962,234	1,074,978	1,065,494	1,176,028

1/ Excludes Alaska, Hawaii, and Puerto Rico.

$\frac{2}{2}$ / N and P₂O₅ contents calculated.

Source: Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States Statistical Reporting Service, U.S. Department of Agriculture.

the same rate as last year even though some plants which had been operated only intermittently have been closed. The same production from reduced capacity means that production rates in operating plants have increased.

Concentrated superphosphate capacity is estimated to be 2.1 million tons of P_2O_5 . This is a gain of about 294,000 tons, or 16 percent over last year.

Ammonium phosphate capacity in plants operated by primary producers is estimated to be about 3.2 million tons of P_2O_5 , up about 14 percent over last year. There are other plants operated by secondary producers which manufacture ammonium phosphate primarily for captive use in mixed fertilizers and liquid ammonium phosphate, and liquid ammonium polyphosphate for use in liquid mixed fertilizer and for direct application. Sufficient information is not available for a reliable capacity estimate of these.

Wet-process phosphoric acid capacity in operating plants is estimated to be 6.3 million tons of P_2O_5 , up about 10 percent over last year. Three plants were reopened and others increased capacity by making technological changes within existing plants.

The above estimates of P_2O_5 capacity are based on current production of the various phosphatic materials. However, these capacities may shift within limits from one material to another, since phosphoric acid is the basic P_2O_5 source for the production of all concentrated phosphatic materials except nitric phosphate. Market conditions govern, within limits, the division of the output into concentrated superphosphate, various grades of ammonium phosphate, liquid base N-P materials, or merchant phosphoric acid.

POTASH (K_2O)

Net domestic supplies of K_2O in 1972-73 are expected to total 4,699,000 tons, 3 percent less than last year (table 4). Imports will be down about 8 percent. Exports will be about 32 percent more than last year. Even though the net quantity moving into trade channels is expected to be 3 percent less than last year, quantities left from last year in distributor and dealer inventories are said to be high. These inventories could mean that the total quantity available to farmers may be close to the quantity available last year.

Potassium chloride - Supplies of domestically produced potassium chloride (muriate of potash) are expected to be about 13 percent more than last year, totaling 2,373,000 tons (table 4). Imports will be down about 8 percent. Exports are expected to be up 36 percent. Taking exports from domestic production means that only 37 percent of the net domestic supply will be from domestic production.

Table 4.--Potash: Estimated supply of K₂O for fertilizer purposes,
United States, fertilizer years, 1970-71, 1971-72, and 1972-73

Item	1970-71 <u>1/</u>	1971-72 <u>1/</u>	1972-73
	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>
Supply from domestic production:			
Potassium chloride	2,163	2,107	2,373
Potassium sulfate <u>2/</u>	292	290	300
All other	35	35	35
Total	2,490	2,432	2,708
Imports:			
Potassium chloride	2,427	3,026	2,800
Potassium sulfate <u>2/</u>	31	24	30
All other	52	38	27
Total	2,510	3,088	2,857
Exports:			
Potassium chloride	471	524	713
Potassium sulfate <u>2/</u>	119	106	104
All other	30	27	49
Total	620	657	866
Net domestic supply	4,380	4,863	4,699

1/ Revised.

2/ Includes potassium-magnesium sulfate.

Potassium sulfates - Domestic supplies of potassium sulfate and potassium magnesium sulfate are expected to total 289,000 tons of K_2O , about the same as last year. Imports will be up 25 percent and exports down about 2 percent.

Potash capacities - U.S. potash production capacity is estimated to be 3.2 million tons of K_2O as of January 1, 1973, according to the latest estimates from the Bureau of Mines.

Canadian capacity is estimated to be about 7.6 million tons of K_2O . This excludes one facility closed in 1970 because of water problems. There is no verification that it has resumed production.

INVENTORIES

Inventories of nitrogen and phosphate materials are reported monthly by the Bureau of the Census. Inventories of each nitrogenous material are the stocks held by producing companies at plants and other locations. Phosphate material inventories are the stocks at producing locations only. Monthly potash inventories are not available from Government sources.

Complete and reliable information is not available on inventories held by secondary manufacturers, distributors, and dealers.

Nitrogen - The inventory of anhydrous ammonia last June was 990,319 tons, about 348,000 tons larger than the previous June (table 5). Stocks of solid ammonium nitrate last June were 68 percent larger than what they had been the previous June, while ammonium sulfate stocks were near the same. Stocks of nitrogen solutions were also about the same as a year ago. Inventories for December and February are shown in the table to illustrate the magnitude of the inventory buildup to meet the peak spring demand.

Phosphate - The wet-process phosphoric acid inventory seems to remain fairly steady (table 5). June stocks of total phosphates have varied less than 30,000 tons the past 3 years. However, December 1972 inventories were up 14 percent over the previous December. Each material in the phosphate group was larger than the year before, except normal and enriched superphosphate.

FOREIGN TRADE IN FERTILIZER

U.S. imports - Eighty-four percent of total fertilizer imports came from Canada last year (table 6). Potassium chloride was 74 percent of the total import from Canada. U.S. companies, or their subsidiaries in Canada, and subsidiaries of Canadian companies in the United States

Table 6.--U.S. imports of selected fertilizer materials by country of origin, fertilizer year 1971-72 1/

Country of origin	Ammonium sulfate	Ammonium nitrate	Anhydrous ammonia	Urea	Short tons of material					Potassium chloride	Potassium sulfate	Potassium sodium nitrate	Mixed fertilizers
					Calcium nitrate	Phosphate Crude	Potassium chloride	Potassium sulfate	Potassium sodium nitrate				
Canada	195,364	390,324	87,697	179,149		6,093 16,784	4,912,230	60	147				179,346
Mexico	2,936						102	25					355
Dominican Republic	15,778				716	38,669							
Trinidad			200,922	45,707									
Netherlands Antilles			82,188										
Colombia			3,550										
Peru													
Chile					152		3,078		19,129				
Sweden					38,266				4,939				8,000
Norway				28,577									3
United Kingdom				493									175
Netherlands	13,818		18,618	97,438	40			1,578					
Belgium				9,312				3,802					
France								42,571					
West Germany	11,023			600	140								482
Switzerland													59
Israel									15,371				53
Japan				3,942									
Australia	24,640					5,512			6				
Union of South Africa													
Guinea													
Zaire													
	263,559	390,324	392,975	365,218	39,314	67,058	5,082,283	48,042	39,586				188,473

1/ Other materials imported were the following: 3,356 tons calcium cyanamide; 159,500 tons sodium nitrate; 22,917 tons potassium nitrate; 84 tons ammonium nitrate-limestone; 119,540 tons nitrogen-solutions; 35,438 tons other nitrogenous materials; 90,662 tons liquid phosphatic fertilizers; 53,808 tons solid phosphatic fertilizer NSPF; 350 tons potassic fertilizers NSPF; 488,865 tons ammonium phosphates; and 47,376 tons fertilizer materials NSPF.

are responsible for a large share of the imports. Calcium nitrate, anhydrous ammonia, potassium sulfate, potassium-sodium-nitrate, and sodium nitrate are important imported fertilizers for which Canada is not the major source. Mexico was the major source of phosphoric acid in 1971-72 and may repeat in 1972-73 even though shipments were late in starting.

Ammonium nitrate, ammonium sulfate, urea, synthetic nitrogenous materials, ammonium phosphate, and potassium chloride were the imported fertilizers which showed gains in 1971-72 over the previous year (table 7). Anhydrous ammonia imports were the smallest since 1967-68.

U.S. exports - Phosphate rock exports were 2.6 times that of all other fertilizer exports combined (table 8).^{*} Canada and Japan again each took over 2 million tons. These two, with eight other countries, took 85 percent of phosphate rock exports. In addition, India, Iran, Romania, and Spain each took from 220,000 to 450,000 tons of phosphate rock, or 9 percent. Exports of anhydrous ammonia, ammonium sulfate, urea, concentrated superphosphate, ammonium phosphate, and potassium chloride ranged from 421,000 tons to 1.5 million tons, ammonium phosphate being the only one to go over 1 million tons.

Urea, concentrated superphosphate, ammonium phosphate, and potassium chloride were the only fertilizers to show gains over 1970-71 (discounting data on synthetic nitrogenous materials, not elsewhere classified) (table 9).^{**} Anhydrous ammonia declined again to reach a level of less than one-half the record export in 1968-69. Ammonium nitrate declined for the third consecutive year. Urea regained some of the precipitous decline in 1970-71. About 50 percent of the anhydrous ammonia went to Europe, and Central and South America took 39 percent of it. Central and South America took 53 percent of the concentrated superphosphate and 41 percent of the ammonium phosphate. Brazil replaced Japan as the most important single market for potassium chloride. Central and South America took 62 percent of the potassium chloride.

About 57 percent of all plant nutrients exported in 1971-72 (excluding phosphate rock) went to countries with AID agricultural programs compared with 45 percent in 1970-71. During the last 5 years, over half of the ammonium sulfate, urea, concentrated superphosphate, ammonium phosphate, and mixed fertilizers have gone to these countries (table 10). The AID countries received 54 percent of the N, 65 percent of the P₂O₅, and 48 percent of K₂O exported by the United States in 1971-72. However, AID did not finance all these shipments. Brazil received 44 percent of the plant nutrients going to AID countries, but none of them were financed by AID.

* Table 8 is on page 16.

** Table 9 is on page 17.

Table 7.--U.S. imports of selected fertilizer materials, fertilizer years 1967-68 through 1971-72

Material	1967-68	1968-69	1969-70	1970-71	1971-72
-----Short tons of material-----					
Anhydrous ammonia	420,125	425,103	477,189	501,451	392,975
Ammonium nitrate	219,529	234,528	306,010	365,943	390,324
Ammonium sulfate	143,155	134,979	179,350	218,752	263,559
Sodium nitrate	195,495	159,875	164,130	188,207	159,500
Calcium nitrate	32,629	50,884	48,747	48,293	39,314
Urea	241,154	251,057	423,577	329,640	365,218
Calcium cyanamide	16,979	15,152	10,862	8,357	3,356
Nitrogen solutions	69,742	80,841	97,651	194,494	119,540
Synthetic nitrogenous material	15,944	15,818	13,112	12,661	35,438
Phosphate, crude	127,650	114,019	153,626	123,194	67,058
Ammonium phosphate	224,497	277,072	395,476	471,779	488,865
Potassium chloride	3,608,238	3,175,006	4,377,755	4,115,291	5,082,283
Potassium sulfate	49,444	40,134	69,717	62,732	48,042
Potassium-sodium nitrate	28,959	32,821	39,094	74,913	39,586
Mixed fertilizers	178,738	161,080	168,668	198,307	188,473

U.S. historical trade balance. The United States shifted from a net importer of nitrogen (N) to a net exporter in 1966 (table 11). The shift resulted primarily from the increased emphasis on the use of fertilizers in the AID programs. A reduction in AID requirements in 1969-70 caused the first decline in N exports since 1962-63. The decline continued in 1970-71, but made recovery in 1971-72.

In phosphates, the United States has maintained an export balance of processed phosphatic fertilizers since 1941. It became more pronounced as AID requirements increased, reaching a peak in 1967-68. The decrease in AID requirements reversed the trend in 1968-69 and 1969-70. Exports picked up again in 1970-71, largely as a result of several countries purchasing concentrated superphosphate and ammonium phosphate to develop markets for plants which were under construction. The tight supply and prices in the world market have made exporting attractive to domestic producers of phosphates since 1970-71. The favorable export market has continued longer than originally expected, but should slacken when the foreign plants start full production.

The United States exported about 28 percent of the processed P_2O_5 in world trade in 1970-71. In addition, the United States has exported 10.6 to 13.6 million tons of phosphate rock in each of the past 5 years.

The United States had an export balance of K_2O from 1955-56 through 1961-62. Production from the newly developed Canadian deposits shifted the balance to imports in 1962-63. Imports of Canadian potassium chloride (KCl) have been larger than deliveries of domestic KCl for the past 3 years.

Table 10.--Percentage of U.S. exports of selected materials going into countries with AID agricultural programs, fertilizer years, 1967-68 through 1971-72 1/

Material	1967-68	1968-69	1969-70	1970-71	1971-72
	-----Percent-----				
Ammonium sulfate	95	95	95	58	72
Anhydrous ammonia	1	8	9	7	19
Ammonium nitrate	34	71	74	47	53
Urea	85	97	97	91	79
Phosphate rock	9	13	15	15	15
Normal superphosphate	30	44	9	16	87
Concentrated superphosphate	70	62	71	70	59
Potassium chloride	26	51	41	37	53
Ammonium phosphate	88	64	62	56	68
Mixed fertilizers	93	85	86	60	71

1/ All quantities not necessarily financed by AID.

Table 8.--U.S. exports of selected fertilizer materials by country of destination, fertilizer year 1971-72 1/

Country of destination	Ammonium sulfate	Anhydrous ammonia	Ammonium nitrate	Urea	Phosphate rock (all)	Normal super-phosphate	Concentrated super-phosphate	Potassium chloride	Ammonium phosphate	Mixed fertilizers
-----Short tons of material-----										
Canada	9,133	2,048	1,296	2,724	2,979,913	1,709	46,977	44,314	43,994	51,333
Mexico	95,011	107,663	13,502	20,730	844,801		241	69,142	663	278
El Salvador	36,641	20		16,863	14,576		4,956	9,041	31,638	4,280
Costa Rica	1,764	14,321		20,831	6,040		11,910	43,289	20,523	74
Jamaica	13,281	13	22	1,300			3,307	13,539	2,751	22
Dominican Republic 2/	47,342	13	44	11,288			9,669	14,646	12,481	58
Trinidad & Tobago		18,519		156			644			101
North America, other	1,945	4,082	640	25,648	269	120	2,673	7,407	6,856	10,124
Colombia	5,511	11,060	278		76,662		15,241	25,302	8,485	1,635
Ecuador			150	837	5,213		3,976	1,917	10,802	74
Chile		41	2,160		55,440		58,505	29,906	3,418	
Brazil 2/		8,184	241	36,716	716,999	7,712		297,565	468,548	21,812
Uruguay	264,888		3,545		43,098			551	10,014	581
Argentina 2/			588	2,211	9		18,530	10,143	40,374	1,098
South America, other		1,608			9,055	2,662	4,103	9,517	14,597	113
Sweden					93,780			7,816		13
Norway					68,269					16
Finland		32,333								18
Denmark		72,960								
United Kingdom		43,655			101,489				1,322	39
Netherlands					561,941		17,312		42,336	61
Belgium-Luxembourg	14,166			18,259	796,076				41,052	47
France	7,835			15,836	515,979		31,019		79,520	8
West Germany			14		1,276,112				2,320	2,891
Austria					103,251		551		1,785	20
Switzerland	4,378				26,625				27,275	299
Spain		13,193		60	251,018		51,293		218,301	
Italy	9,665	8		17,059	1,140,966					
Romania		39,574			220,877					
Turkey 2/										
Europe, other										
Lebanon	19	17,569	11,149	6,066	315,662		5,920		21,289	260
Iran					437,591		1,982			4
India 2/	31,946						45,206		338,184	33,929
Pakistan 2/									11,027	9
South Vietnam				131,223			9,759	4,842	9,691	102,192
Singapore 2/	8,752			71,045			5,603	9,436	1,124	58
Indonesia 2/	44			42,773			33,149	75	39,587	403
Philippines 2/				9	125,668					
Korea, Republic of 2/					521,913					2
Taiwan				85	69,835					113
Japan	939	9	12	12,870	2,187,960		25,723	34,161	4,787	766
Asia, other				8,155			15	70,635		175
Australia				25				36,309	2,225	10,057
New Zealand				1,683	12,032			80,407		61
Oceania, other			6	10	1,751			38,808		
Algeria	20	31,934					64,902		15,934	7
Ethiopia 2/			95			60		33	8,615	
Africa, other	4,282	2,058								
Total	557,562	420,865	33,742	464,462	13,580,470	13,637	723,701	858,869	1,541,521	243,022
Amount to AID countries	389,430	78,078	17,797	366,621	2,012,365	11,868	125,845	458,455	1,041,903	171,799
Percent to AID countries	72	19	53	79	15	87	59	53	68	71

1/ Other exports: 982 tons sodium nitrate; 11,170 tons natural crude potash salts; 98,124 tons nitrogenous chemical fertilizers, nec; 6,880 tons basic slag; 211,366 tons potassium chemical fertilizers nec; and 21,960 tons organic materials.

2/ Countries with active AID agricultural programs. All quantities not necessarily financed.

Table 9.--U.S. exports of selected fertilizer materials, fertilizer years 1967-68 through 1971-72

Material	1967-68	1968-69	1969-70	1970-71	1971-72
-----Short tons of material-----					
Anhydrous ammonia	465,913	997,874	764,649	598,426	420,865
Ammonium nitrate	49,020	110,147	81,211	58,621	33,742
Ammonium sulfate	1,226,520	1,185,431	528,444	600,833	557,562
Sodium nitrate	282	1,416	585	2,063	982
Urea	149,080	565,068	670,841	374,152	464,462
Synthetic nitrogenous materials n. e. c.	26,108	22,971	32,482	47,528	98,124
Phosphate rock	10,646,019	12,386,894	10,972,968	12,757,600	13,580,470
Normal superphosphate	102,681	37,396	36,359	17,637	13,637
Concentrated superphosphate	869,792	1,089,075	710,461	627,064	723,901
Ammonium phosphate	1,516,558	970,316	986,051	1,135,089	1,541,521
Potassium chloride	1,009,501	1,057,432	902,408	772,248	858,869
Potassium sulfate	151,698	232,511	186,138	238,047	211,366
Mixed fertilizers	235,455	268,912	403,981	317,338	243,022

Table 11.--U.S. imports and exports of primary plant nutrients, 1951-52 through 1972-73

Fertilizer Year	N		P ₂ O ₅		K ₂ O	
	Imports	Exports	Imports	Exports	Imports	Exports
	----- 1,000 tons -----					
1951-52	290	73	39	94	264	63
1952-53	429	44	41	74	159	54
1953-54	421	62	62	88	121	54
1954-55	373	141	61	154	139	91
1955-56	330	255	56	153	170	180
1956-57	294	268	54	256	179	315
1957-58	305	227	59	246	213	252
1958-59	294	223	64	204	238	310
1959-60	298	188	82	177	282	418
1960-61	276	213	67	238	285	484
1961-62	337	234	87	283	282	503
1962-63	344	196	117	275	486	411
1963-64	453	264	100	400	691	526
1964-65	470	392	98	432	884	625
1965-66	529	546	125	441	1,332	664
1966-67	669	749	165	787	1,643	678
1967-68	675	1,045	169	1,145	2,225	714
1968-69	690	1,594	183	995	1,944	798
1969-70	855	1,328	273	845	2,646	681
1970-71	929	1,077	283	898	2,510	620
1971-72	843	1,032	326	1,102	3,088	657
1972-73*	971	1,259	373	1,499	2,857	866

* Estimated.

-----	Import Balance	-----	Export Balance
-----		-----	

THE WORLD FERTILIZER MARKET

World interest in fertilizer has intensified as demonstrations have shown how the yield of crops can be increased through the use of fertilizer. Fertilizer is an important tool for increasing needed food production in the developing countries and for use by developed countries to produce surplus food, which can be shared with developing countries until agricultural production can be increased sufficiently to meet essential needs.

World production of primary plant nutrients totaled about 71 million metric tons ^{1/} in 1970-71 (tables 12, 13, and 14). Consumption totaled close to 68 million metric tons. The developed countries are the leading producers of the primary plant nutrients.

The United States ranked number one in total use of each of the primary plant nutrients and in the production of N and P₂O₅ in 1970-71. It produced 24 percent of the world's plant nutrients and used 23 percent of them.

Nitrogen - In 1970-71, the United States produced 28 percent of the world's supply of N for fertilizer, consumed 23 percent, and ranked number two as an importer and exporter (table 12). China ranked number one as an importer, importing more than twice as much as any other country. India, Indonesia, Brazil, and Turkey, all AID participants, ranked among the top ten importers. Japan, Netherlands, Belgium, Canada, and Norway each exported more N than it used at home.

Phosphate - The United States continued in 1970-71 as the leading producer, consumer, and exporter of P₂O₅ (excluding phosphate rock) (table 13). It produced 26 percent and consumed 22 percent of the world's fertilizer P₂O₅. Brazil, Chile, and Turkey, all AID participants, ranked in the top ten importers. Belgium, Luxembourg, Netherlands, and Tunisia exported more P₂O₅ than was used at home.

Potash - The United States ranked fourth as a producer, but first as a consumer and as an importer of K₂O in 1970-71 (table 14). The U.S.S.R. ranked first as a producer and second as a user of potash. Canada and East Germany, of the major producers, exported more K₂O than was used at home. Poland, Japan, United Kingdom, Czechoslovakia, Brazil, Belgium, Netherlands, Hungary, and Denmark, in order, are the major importers after the United States. The first five of these rank in the top ten as users of K₂O.

^{1/} Multiply metric tons by 1.1023 to convert to short tons.

Table 12.-- Nitrogen: Production, consumption, and foreign trade by leading countries, 1970-71

Country	Production		Imports		Exports		Consumption	
	Metric tons N	Rank	Metric tons N	Rank	Metric tons N	Rank	Metric tons N	Rank
United States	9,290,667	1	842,000	2	977,000	2	7,189,448	1
U. S. S. R.	5,423,000	2	-----	-	215,000	8	4,605,000	2
Japan	2,105,100	3	-----	-	1,410,500	1	865,700	7
West Germany	1,504,577	4	132,113	-	482,971	4	1,130,822	6
France	1,351,069	5	207,908	6	191,571	9	1,453,446	5
China	1,200,000 ^{1/}	6	1,707,000 ^{1/}	1	-----	-	2,987,000 ^{1/}	3
Poland	1,029,879	7	70	-	186,748	-	823,100	8
Italy	955,814	8	83,684	-	422,660	7	594,547	10
Netherlands	929,905	9	14,403	-	594,907	3	405,260	-
India	846,147	10	490,867	3	-----	-	1,487,131	4
United Kingdom	747,900	-	131,400	-	39,000	-	800,100	9
Belgium	485,856	-	80,777	-	441,954	5	167,200 ^{1/}	-
Canada	704,800	-	16,500	-	434,200 ^{1/}	6	287,100	-
Norway	369,700	-	3,100	-	300,600	8	77,800	-
Romania	646,917	-	700	-	187,000 ^{1/}	10	366,900	-
Brazil	20,405	-	255,225	4	-----	-	275,630	-
Denmark	73,708	-	237,390	5	-----	-	288,972	-
East Germany	378,009	-	159,990	7	2,000	-	511,200	-
Cuba	4,537	-	154,002	8	-----	-	158,800	-
Turkey	82,000 ^{1/}	-	152,000 ^{1/}	9	-----	-	243,000 ^{1/}	-
Indonesia	45,100 ^{1/}	-	138,000 ^{1/}	10	-----	-	183,100 ^{1/}	-
World Total	32,640,614		6,409,761		6,515,347		31,604,880	

^{1/} Unofficial figure.

Source: Annual Fertilizer Review 1971, Food and Agriculture Organization of The United Nations.

Table 13.-- Phosphate: P₂O₅ production, consumption, and foreign trade by leading countries, 1970-71

Country	Production		Imports		Exports		Consumption	
	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank
United States	5,388,000	1	257,000	2	775,000	1	4,341,165	1
U. S. S. R.	2,500,000	2	-----	-	131,900	7	2,211,000	2
France	1,450,846	3	339,712	1	97,327	9	1,809,390	3
West Germany	945,806	4	98,690	6	142,163	6	913,095	4
Belgium	741,331	5	47,912	-	447,562	2	148,200	-
Australia	694,724	6	15,000 1/	-	-----	-	743,200	5
Japan	665,300	7	21,500	-	-----	-	652,900	6
Poland	599,238	8	12,112	-	-----	-	635,800	7
China	572,000 1/	9	2,000 1/	-	-----	-	574,000	8
United Kingdom	523,600	10	62,800	-	15,200	-	542,600	9
Italy	509,933	-	133,457	4	69,977	10	518,418	10
Canada	523,000 1/	-	25,700 1/	-	260,000 1/	3	287,000 1/	-
Netherlands	275,207	-	49,665	-	209,600	4	109,382	-
Tunisia	197,000 1/	-	-----	-	175,300	5	28,000 1/	-
Luxembourg	139,048	-	-----	-	122,396	8	6,958	-
Brazil	160,404	-	214,961	3	-----	-	375,365	-
Bulgaria	141,600 1/	-	130,000 1/	5	-----	-	271,600 1/	-
Chile	14,400	-	88,000 1/	7	-----	-	102,100	-
Cuba	-----	-	85,610 1/	8	-----	-	92,100	-
Turkey	63,000 1/	-	74,000 1/	9	-----	-	175,900 1/	-
Hungary	167,219	-	65,700 1/	10	1,077	-	217,015	-
World Total	20,628,503		2,731,597		2,758,512		19,788,229	

1/ Unofficial figure.

Source: Annual Fertilizer Review 1971, Food and Agriculture Organization of The United Nations.

Table 14.-- Potash: K₂O production, consumption, and foreign trade by leading countries, 1970-71

Country	Production		Imports		Exports		Consumption	
	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank
U. S. S. R.	4,087,000	1	-----	-	1,309,200	3	2,574,000	2
Canada	3,178,800	2	26,000	1/	2,959,000	1/	204,300	1/
East Germany	2,419,000	3	-----	-	1,739,000	2	613,900	6
United States	2,352,000	4	2,278,000	1	563,000	6	3,788,619	1
West Germany	2,292,966	5	40,604	-	1,176,010	4	1,184,580	4
France	1,841,856	6	183,146	-	859,125	5	1,388,815	3
Israel	575,840	7	-----	-	562,275	7	10,855	-
Spain	524,927	8	-----	-	266,974	8	205,975	-
Congo	166,000	9	-----	-	47,105	9	4,000	1/
Italy	155,030	10	178,259	-	-----	10	225,290	-
Poland	-----	-	1,143,830	2	-----	-	1,115,000	5
Japan	-----	-	632,500	3	-----	-	606,100	7
United Kingdom	-----	-	530,600	4	-----	-	533,800	8
Czechoslovakia	-----	-	526,319	5	-----	-	514,200	1/
Brazil	-----	-	306,221	6	-----	-	306,221	9
Belgium	-----	-	305,575	7	-----	-	185,400	1/
Netherlands	-----	-	239,625	8	-----	-	135,029	-
Hungary	-----	-	235,763	9	-----	-	228,957	-
Denmark	-----	-	188,039	10	-----	-	181,669	-
World Total	17,687,488		9,361,934		9,490,957		16,522,449	

1/ Unofficial figure.

Source: Annual Fertilizer Review 1971, Food and Agriculture Organization of The United Nations.

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